

CLAIMS

What is claimed is:

- 1 1. A communications board comprising:
2 an FR-4 circuit board having a thickness of $0.06 \pm 10\%$ inches;
3 a side-fed patch antenna having the circuit board as a dielectric spacer, the antenna further
4 having:
5 a ground plane on a first side of the circuit board, wherein the ground plane has a
6 width of at least $1.875 \pm 10\%$ inches and a length of at least $2.25 \pm 10\%$
7 inches;
8 a rectangular patch on a second side of the circuit board opposite the first side,
9 wherein the patch has a width of $1.5 \pm 10\%$ inches and a length of 1.164
10 $\pm 10\%$ inches; and
11 a feed connected to a side of the patch halfway along the width, wherein the feed
12 has a width of $0.07 \pm 10\%$ inches and a length of at least $0.625 \pm 10\%$ inches.
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1 4. The communications board of claim 1, further comprising:
2 a radio-frequency ("RF") module coupled to the patch antenna and configured to convert
3 signals between baseband and an operating frequency range of the patch antenna.

1 5. The communications board of claim 4, further comprising:
2 a USB bus interface that couples the RF module to a USB bus.

1 6. A set-top box comprising:
2 a metallic enclosure having a front face;
3 a non-metallic bezel attached to the front face of the enclosure and defining an interstitial
4 space between the front face and the bezel; and
5 a communications board located in said interstitial space, wherein the communications
6 board includes:
7 an FR-4 circuit board having a thickness of $0.06 \pm 10\%$ inches; and
8 a side-fed patch antenna having the circuit board as a dielectric spacer.

1 7. The set-top box of claim 6, wherein the patch antenna further includes:
2 a ground plane on a first side of the circuit board, wherein the ground plane has a width of
3 at least $1.875 \pm 10\%$ inches and a length of at least $2.25 \pm 10\%$ inches;
4 a rectangular patch on a second side of the circuit board opposite the first side, wherein the
5 patch has a width of $1.5 \pm 10\%$ inches and a length of $1.164 \pm 10\%$ inches; and
6 a feed connected to a side of the patch halfway along the width, wherein the feed has a
7 width of $0.07 \pm 10\%$ inches and a length of at least $0.625 \pm 10\%$ inches.

1 8. The set-top box of claim 6, wherein the patch antenna is configured to operate between
2 2.400 and 2.483 GHz.

1 9. The set-top box of claim 7, wherein the patch and feed comprise copper cladding having a
2 thickness of approximately 0.063 inches.

1 10. The set-top box of claim 6, further comprising:
2 a radio-frequency ("RF") module coupled to the patch antenna and configured to convert
3 signals between baseband and an operating frequency range of the patch antenna.

4 11. The set-top box of claim 10, further comprising:
5 a USB bus interface coupled to the RF module; and
6 a USB bus that couples the USB bus interface to electronic circuitry in said metallic
7 enclosure.

1 12. The set-top box of claim 6, wherein the communications board is mounted flush against the
2 front face of the metallic enclosure.

1 13. The set-top box of claim 6, wherein the communications board is mounted about 1.23
2 inches from the front face of the metallic enclosure.

1 14. The set-top box of claim 6, wherein the patch antenna is less than about 0.5 inches from the
2 bezel.